

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

Claims 1-21 (canceled)

1 Claim 22 (new): A method of improving the thermal stability
2 of a compound semiconductor material comprising:

3 depositing a layer of said compound semiconductor
4 material including therein acceptors; and

5 wherein said acceptors have an electronic energy level
6 below the midgap energy level of the neutral antisite
7 defects of said compound semiconductor material; and

8 wherein the concentration of said acceptors is balanced
9 with the concentration of said antisite defects; and

10 wherein said improved thermal stability is such that
11 the properties of said compound semiconductor material are
12 substantially unaffected by subsequent high temperature
13 processing of said compound semiconductor material.

1 Claim 23 (new): A method as in claim 22 wherein said
2 compound semiconductor material is selected from the group
3 consisting of III-V semiconductor material, InGaAs and
4 AlGaP.

1 Claim 24 (new): A method as in claim 22 wherein said
2 acceptors are selected from the group consisting of C, Be,
3 Zn, Mg, Fe, Cu, Mn and Ni.

1 Claim 25 (new): A method as in claim 22 wherein said
2 acceptors are Be and said compound semiconductor material is
3 LT-GaAs.

1 Claim 26 (new): A method as in claim 25 wherein said LT-GaAs
2 is deposited by molecular beam epitaxy at a temperature in
3 the range from approximately 200°C to approximately 400°C;
4 and

5 wherein said LT-GaAs is doped during growth with Be at
6 a temperature greater than approximately 230°C.

1 Claim 27 (new): A method of producing a compound
2 semiconductor material having short carrier trapping times
3 comprising:

4 depositing a layer of said compound semiconductor
5 material including therein acceptors; and

6 wherein said acceptors have an electronic energy level
7 below the midgap energy level of the neutral antisite
8 defects of said compound semiconductor material; and

9 wherein the concentration of said acceptors is balanced
10 with the concentration of said antisite defects; and

11 wherein said carrier trapping times are less than the
12 carrier trapping times of said compound semiconductor
13 material lacking said acceptors.

1 Claim 28 (new): A method as in claim 27 wherein said
2 compound semiconductor material is selected from the group
3 consisting of III-V semiconductor material, InGaAs and
4 AlGaP.

1 Claim 29 (new): A method as in claim 27 wherein said
2 acceptors are selected from the group consisting of C, Be,
3 Zn, Mg, Fe, Cu, Mn and Ni.

1 Claim 30 (new): A method as in claim 27 wherein said
2 acceptors are Be and said compound semiconductor material is
3 LT-GaAs.

1 Claim 31 (new): A method as in claim 25 wherein said LT-GaAs
2 is deposited by molecular beam epitaxy at a temperature in
3 the range from approximately 200°C to approximately 400°C;
4 and

5 wherein said LT-GaAs is doped during growth with Be at
6 a temperature greater than approximately 230°C; and

7 wherein said carrier trapping times are less than
8 approximately 5.5 picoseconds.